CLAIMS

1. A multilayer optical compensation film comprising one or more optically anisotropic layers X and one or more optically anisotropic layers Z wherein, said each layer X has its optic axis tilted with respect to the plane of said multilayer compensation film, and said each layer Z comprises amorphous polymer with glass transition temperature above 180C°, and satisfies the following two relations:

$$|nx-ny|<0.001 \qquad (1)$$

$$\Delta n_{th} = nz-(nx+ny)/2<-0.005 \qquad (2).$$

wherein:

"nx" and "ny" are indices of refraction in the film plane parallel to the x and y directions which represent orthogonal directions in the plane of the film;

"nz" is the index of refraction in the z-direction that corresponds to the film-thickness direction; and

"Δn_{th}", is the out of-plane birefringence.

2. A multilayer optical compensation film according to claim 1 wherein, at least one X layer comprises positively birefringent material.

3. A multilayer optical compensation film according to claim 1 wherein, at least one X layer comprises negatively birefringent material.

4. A multilayer optical compensation film according to claim 1 wherein, the tilt angle θ of the optic axis with respect to the x-y plane of at least one X layer is constant in the thickness direction of the X layers.

5. A multilayer optical compensation film according to claim 1 wherein, the tilt angle θ of the optic axis with respect to the x-y plane of at least one X layer changes in the thickness direction of the X layers.

6. A multilayer optical compensation film according to claim 1 wherein, the azimuthal angle φ of the optic axis of at least one X layer is constant in the thickness direction of the X layers.

7. A multilayer optical compensation film according to claim 1 wherein, the azimuthal angle φ of the optic axis of at least one X layer changes in the thickness direction of the X layers.

8. A multilayer optical compensation film according to claim 1 wherein, the layers X and the layers Z are disposed on a substrate.

9. A multilayer optical compensation film according to claim 1 wherein, one or more adhesion promotion layers is disposed within the compensation film.

10. A multilayer optical compensation film according to claim 9 wherein, at least one of the adhesion promotion layers functions also as alignment layer.

11. A multilayer optical compensation film according to claim 9 wherein, at least one of the adhesion promotion layers functions also as barrier layer.

12. A multilayer optical compensation film according to claim 1 wherein, one or more alignment layers is disposed within the compensation film.

13. A multilayer optical compensation film according to claim 12 wherein, at least one of the alignment layers functions also as barrier layer.

14. A multilayer optical compensation film according to claim 1 wherein, one or more barrier layer is disposed within the compensation film.

15. A multilayer optical compensation film according to claim 1 wherein, one or more Z layers function as adhesion promotion layers.

16. A multilayer optical compensation film according to claim 1 wherein, one or more Z layers function as barrier layers.

17. A multilayer optical compensation film according to claim 1 wherein, one or more Z layers function as alignment layers.

18. A multilayer optical compensation film according to claim 1 wherein, one or more X layers function as adhesion promotion layers.

19. A multilayer optical compensation film according to claim 1 wherein, one or more X layers function as barrier layers.

20. A multilayer optical compensation film according to claim 1 wherein, one or more X layers function as alignment layers.

21. A multilayer optical compensation film according to claim 1 wherein, the thickness of each Z layer is from 0.1 to 20μm.

22. A multilayer optical compensation film according to claim 21 wherein, the thickness of each Z layer is from 1.0 to 10.0 μm.

23. A multilayer optical compensation film according to claim 22 wherein, the thickness of each Z layer is from 2.0 to 8.0μm.

24. A multilayer optical compensation film according to claim 1 wherein, the thickness of said compensation film is less than 50μm.

25. A multilayer optical compensation film according to claim 24 wherein, the thickness of said compensation film is from 4 to 45μm.

26. A multilayer optical compensation film according to claim 25 wherein, the thickness of said compensation film is from 5 to 20μm.

27. A display comprising a) a liquid crystal cell, b) at least one polarizing element, and c) at least one optical compensation film according to claim1.

28. A display according to claim 27 wherein, the liquid crystal cell is an Optically Compensated Bend mode cell.

29. A display according to claim 27 wherein, the liquid crystal cell is a Twisted Nematic mode cell.

30. A display according to claim 27 wherein, the liquid crystal cell is a Vertically Aligned mode cell.

31. A multilayer optical compensation film according to claim 1 wherein, one or more Z layers comprises a polymer containing in the backbone a vinyl, carbonyl, amide, imide, ester, carbonate, aromatic, sulfone, or azo group.

32. A multilayer optical compensation film according to claim 1 wherein, one or more Z layers comprises a polymer containing a non-visible chromophore group which includes a carbonyl, amide, imide, ester, carbonate, phenyl, naphthyl, biphenyl, bisphenol, or thiophene group.

33. A multilayer optical compensation film according to claim 1 wherein, one or more Z layers comprises 1)poly(4,4'-hexafluoroisopropylidene-bisphenol) terephthalate-co-isophthalate, 2)poly(4,4'-hexahydro-4,7-methanoindan-5-ylidene bisphenol) terephthalate, 3) poly(4,4'-isopropylidene-2,2'6,6'-tetrachlorobisphenol) terephthalate-co-isophthalate, 4) poly(4,4'-hexafluoroisopropylidene)-bisphenol-co-(2-norbornylidene)-bisphenol terephthalate, 5) poly(4,4'-hexahydro-4,7-methanoindan-5-ylidene)-bisphenol-co-(4,4'-isopropylidene-2,2',6,6'-tetrabromo)-bisphenol terephthalate, or 6) poly(4,4'-isopropylidene-bisphenol-co- 4,4'-(2-norbornylidene) bisphenol) terephthalate-co-isophthalate or copolymers of any of the foregoing.

34. A multilayer optical compensation film according to claim 1 wherein, one or more Z layers comprises poly(4,4'-hexafluoroisopropylidene-bisphenol-co- 4,4'-(2-norbornylidene) bisphenol) terephthalate-co-isophthalate or copolymers thereof.

35. A multilayer optical compensation film according to claim 1 wherein, the substrate of claim 8 is glass.

36. A multilayer optical compensation film according to claim 1 wherein, the substrate of claim 8 is comprised of triacetylcellulose, (TAC), cellulose acetate butyrate (CAB), polycarbonate or cyclic polyolefin.